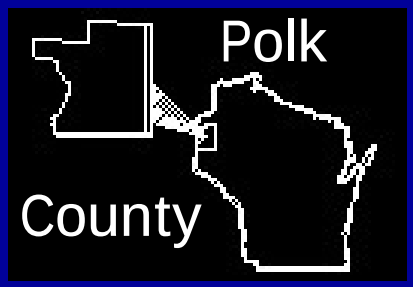
# Ground-Water in Pierce, Polk, and St. Croix Counties, WI




St. Croix County


USGS science for a changing world

UW Extension WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY

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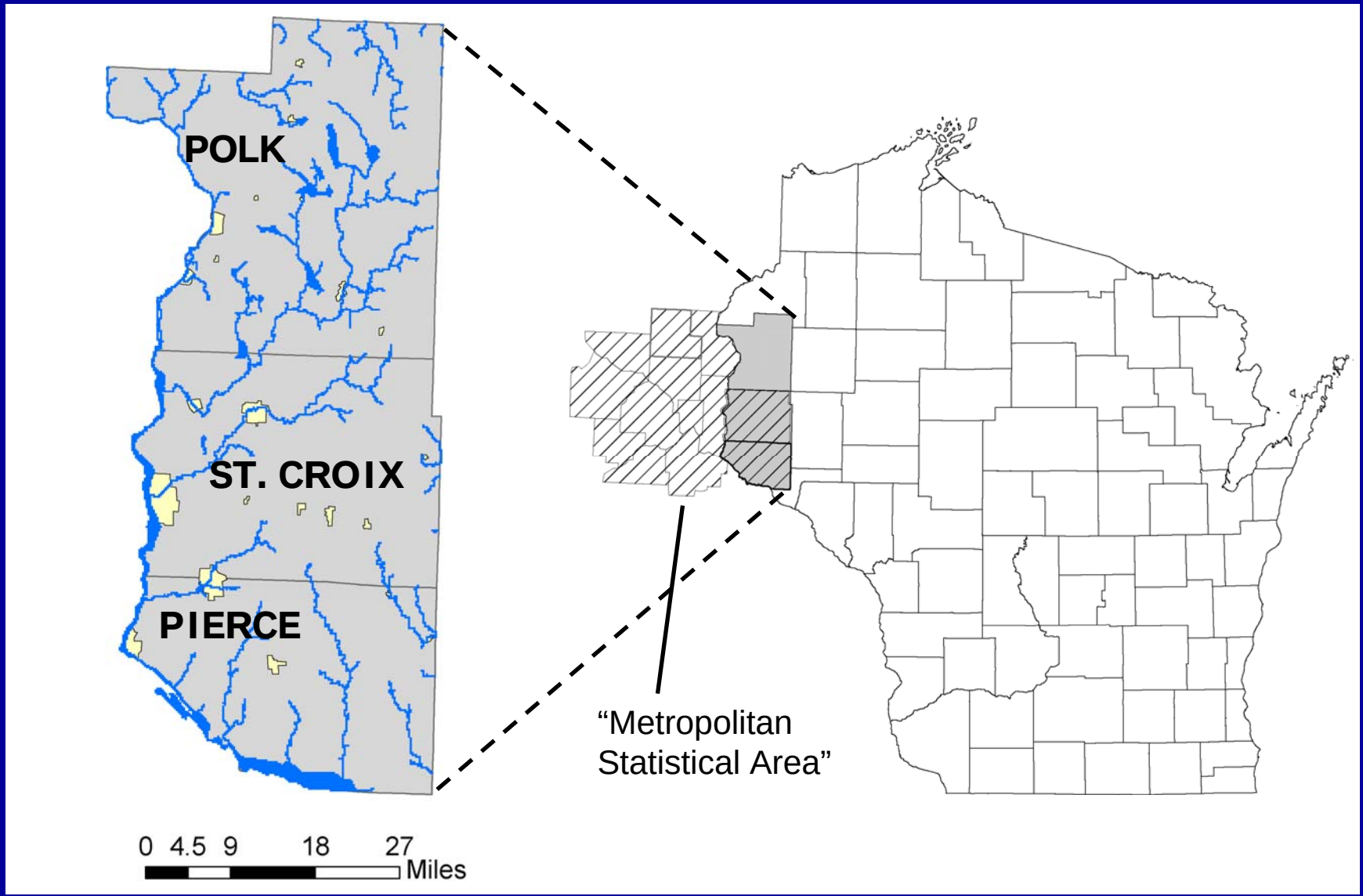
# The “Tri-County” Area

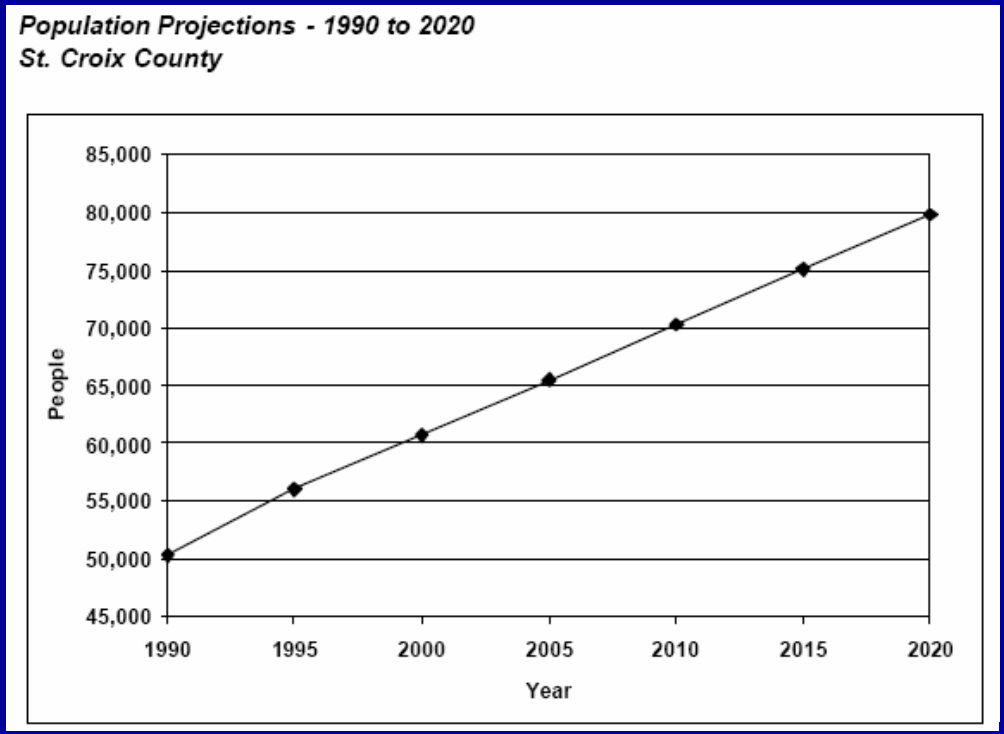


# Tri-County Area

- Proactive
  - Currently, minimal adverse effects from pumping
  - Engaged public and government agencies
- Ground water is sole source of drinking water (public and private)
  - Relatively small municipal pumping:
    - Polk County: 2.5 MGD
    - St. Croix County: 4.2 MGD
    - Pierce County: 2.2 MGD
  - About 50% of population is supplied by private wells.
  - Numerous water-quality concerns
    - Nutrients in ground water (nitrates)
    - Landfill and other industrial leachate
    - Natural minerals (arsenic)

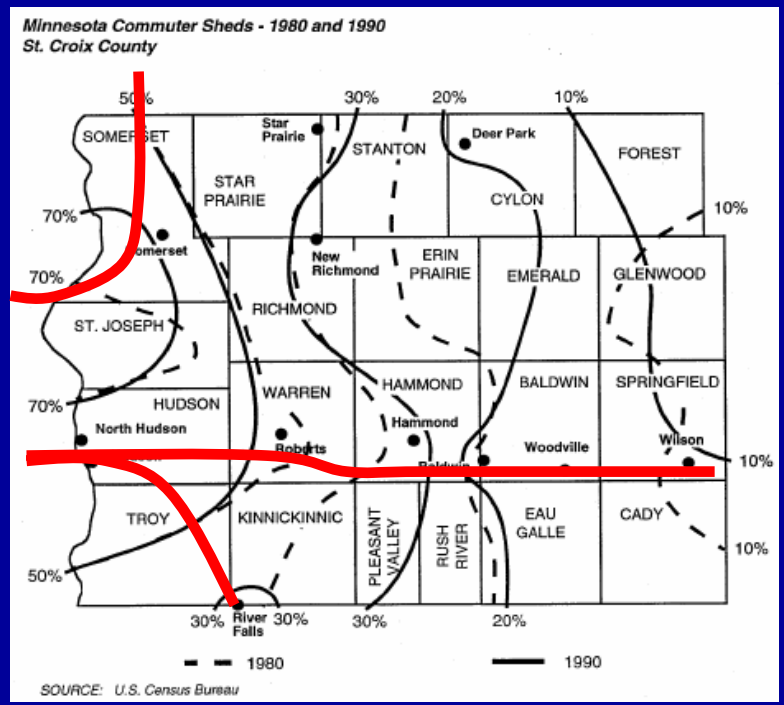
# Tri-County Area

- Imminent large-scale increase in population/groundwater use
  - Average population increase per decade:
    - Pierce: 13%
    - St. Croix: 20%
    - Polk: 12%



# Tri-County Area

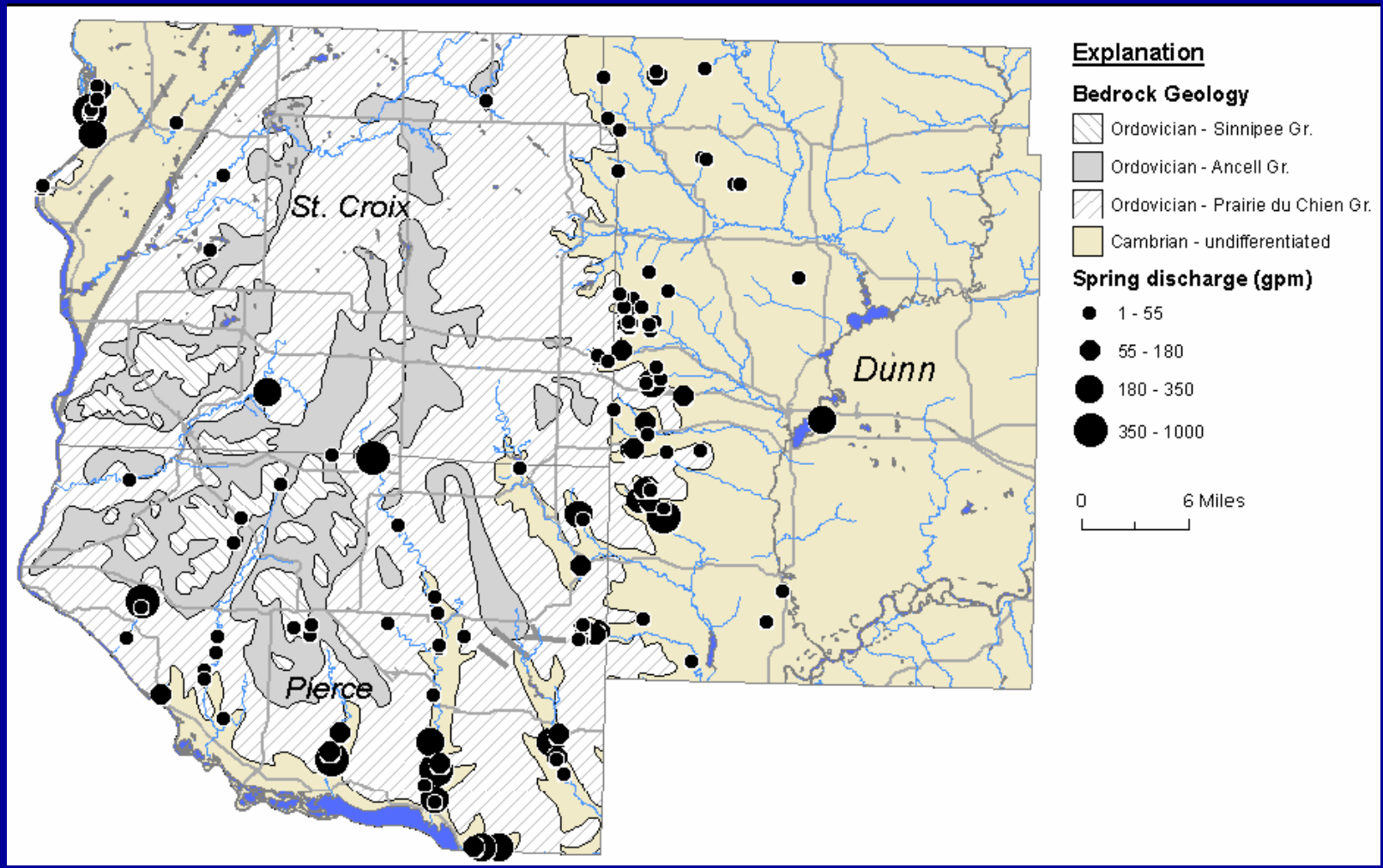
- Imminent large-scale increase in population/groundwater use
  - Major transportation improvements are underway
    - Stillwater bridge will effect Osceola in Polk Co.
    - I94 currently effects St. Croix County
    - Hwy 35 expansion will effect Pierce County



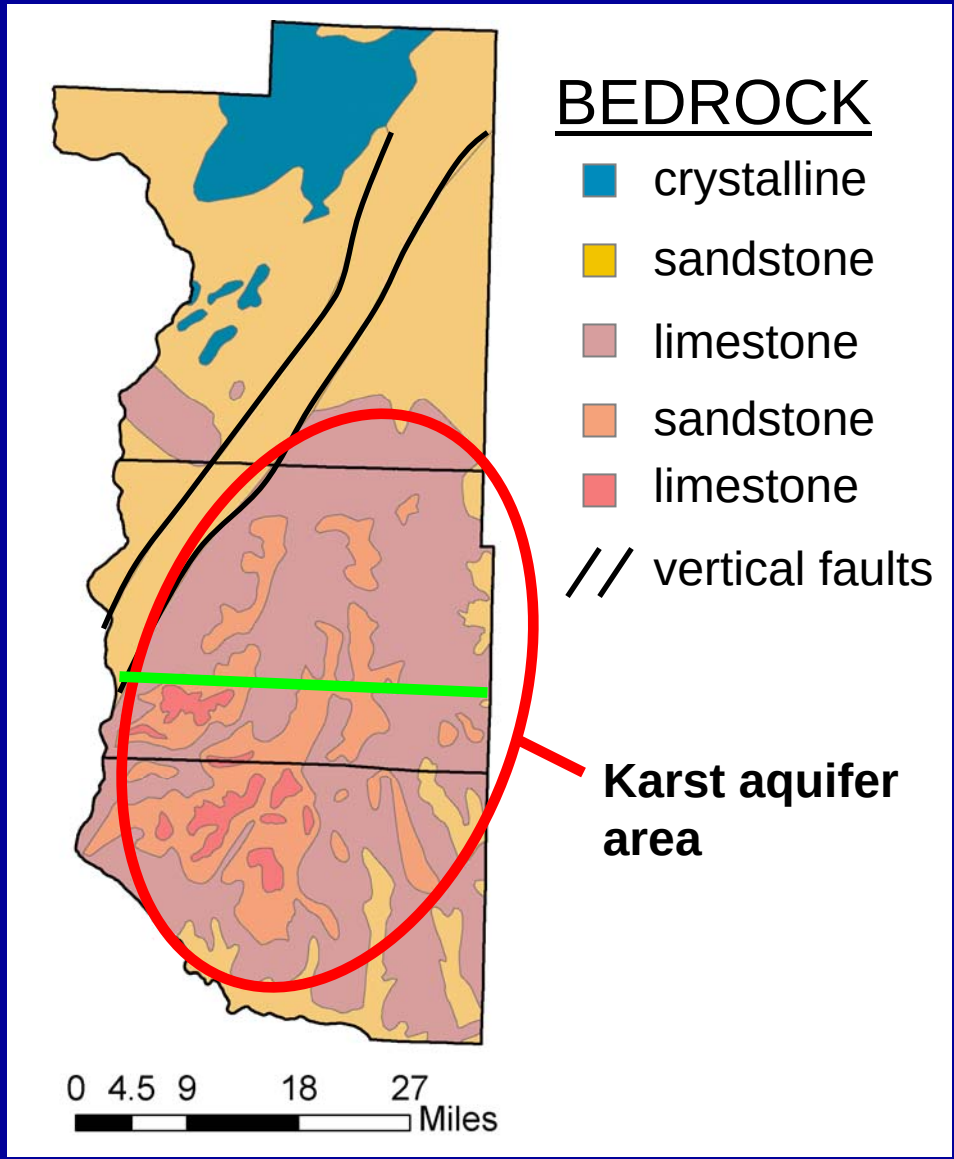
# Tri-County Area – GMA?

- Extensive Karst Aquifers
  - Most susceptible type of aquifer to contamination
    - Rapid infiltration through sink holes (waste water discharge)
    - little filtering by the aquifer (flow through fractures)
  - Heavily utilized aquifer (75% of private wells in St. Croix County)
- Concentration of high-quality water resources
  - 10 Class 1 trout streams, including: Kinnickinnic, Rush Rivers
  - Over 125 mapped springs; at least 17 flow at $\geq$ 0.5 cfs

# Spring Locations



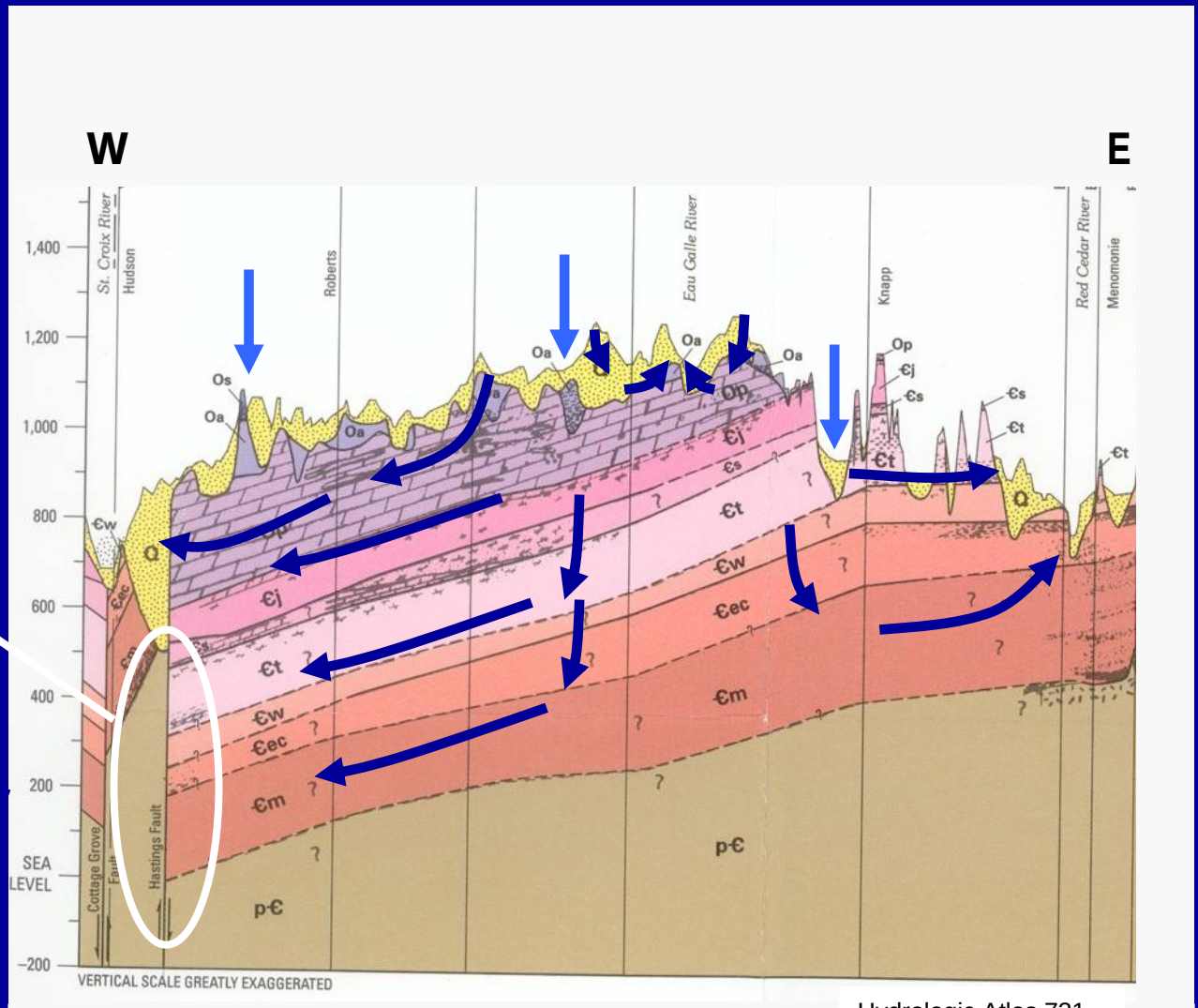
# Tri-County Hydrogeology



# Conceptual Model

## central & southern study area – St. Croix & Pierce

Faults that affect upper aquifers, not just deep aquifers as in southeast WI




Hydrologic Atlas 731

# USGS Project Objectives

- Improve overall understanding of the hydrology of Pierce, Polk and St. Croix counties
- Provide a quantitative framework for testing possible future change

## Deliverables

- Simulations of regional ground-water flow patterns and surface water interaction
- Targeted (inset) ground-water flow models – one for each county